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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,417	02/19/2002	Takuya Tanaka	TANAKA=111	9295

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EXAMINER
JACKSON, MONIQUE R

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/076,417	Applicant(s) TANAKA ET AL.	
	Examiner Monique R Jackson	Art Unit 1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3-4 and 10-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terms "hard particles" and "soft metal" in claims 3-4 are relative terms which render the claim indefinite. The terms "hard" and "soft" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Hence, it is not clear as to how hard or soft the particles and/or metal to be incorporated into the resin surface layer are required to be.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiya et al (USPN 5,525,246) in view of Oohira et al (USPN 6,569,816.) Kamiya et al teaches sliding bearing and a method of making a sliding bearing wherein a resin surface layer is provided on a roughened surface of an aluminum bearing alloy layer, and then heated or fired to hardened the surface layer wherein an intermediate bonding layer may be first applied to the roughened

surface, wherein the resin surface layer comprises a polyimide binder, such as an aromatic polyimide, wherein the polyimide binder may be modified with isocyanate, DAPI or DONA to provide varnish; and a solid lubricant such as MoS2, BN, WS2, graphite or the like wherein the solid lubricants have the function of lowering and stabilizing the coefficient of friction, and may further include a friction adjusting agent that replaces part of the solid lubricant wherein the friction adjusting agent may be CrO_3, PbO, Al_2O_3, SiC or the like (*reads on "hard particles and a soft metal"*) (Abstract; Col. 2, lines 1-58; Col. 2, line 65-Col 3, line 48.) Kamiya et al further teach that the coating layer may be two or more layers wherein the Examiner takes the position that the invention taught by Kamiya et al comprising two layers reads on the limitation a bonding layer comprising a thermosetting resin (Col. 2, lines 22-57), however it is further noted that the incorporation of an intermediate thermosetting adhesive layer to improve adhesion between the bearing alloy and the resin surface layer would have been obvious to one having ordinary skill in the art at the time of the invention. Kamiya et al do not teach that the resin surface layer comprises polybenzimidazole as instantly claimed. However, Oohira et al teaches that polybenzimidazole in a lubricating layer for a bearing is an appropriate filler for providing improved friction and wear properties as well as improved sliding properties and functionally equivalent to SiC, MoS_2, BN, WS_2, graphite (Col. 10, lines 20-40.) Hence, one having ordinary skill in the art at the time of the invention would have been motivated to utilize polybenzimidazole in the resin layer taught by Kamiya et al given the teachings of Oohira et al that polybenzimidazole is a functionally equivalent lubricating filler suitable in a lubricating composition for bearings.

5. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiya et al (USPN 5,525,246) in view of Andres et al (USPN 5,391,605) or Korshak et al (USPN 3,652,408.) Kamiya et al teaches sliding bearing and a method of making a sliding bearing wherein a resin surface layer is provided on a roughened surface of an aluminum bearing alloy layer, and then heated or fired to hardened the surface layer wherein an intermediate bonding layer may be first applied to the roughened surface, wherein the resin surface layer comprises a polyimide binder, such as an aromatic polyimide, wherein the polyimide binder may be modified with isocyanate, DAPI or DONA to provide varnish; and a solid lubricant such as MoS2, BN, WS2, graphite or the like wherein the solid lubricants have the function of lowering and stabilizing the coefficient of friction, and may further include a friction adjusting agent that replaces part of the solid lubricant wherein the friction adjusting agent may be CrO_3, PbO, Al_2O_3, SiC or the like (*reads on "hard particles and a soft metal"*) (Abstract; Col. 2, lines 1-58; Col. 2, line 65-Col 3, line 48.) Kamiya et al further teach that the coating layer may be two or more layers wherein the Examiner takes the position that the invention taught by Kamiya et al comprising two layers reads on the limitation a bonding layer comprising a thermosetting resin (Col. 2, lines 22-57), however it is further noted that the incorporation of an intermediate thermosetting adhesive layer to improve adhesion between the bearing alloy and the resin surface layer would have been obvious to one having ordinary skill in the art at the time of the invention. Kamiya et al do not teach that the resin surface layer comprises polybenzimidazole as instantly claimed. However, Andres et al teach a self-lubricating composition comprising polybenzimidazole, an aromatic polyimide, and internal lubricants such as graphite and boron nitride, useful for preparing bearings having excellent lubricating or low friction properties.

Korshak et al also teach that polybenzimidazole as an aromatic polyimide in conjunction with a filler such as MoS2 provides excellent antifriction properties. Hence, one having ordinary skill in the art at the time of the invention would have been motivated to utilize polybenzimidazole as the polyimide resin in the surface layer taught by Kamiya et al given the teachings of Andrkes et al or Korshak et al that polybenzimidazole is suitable in a lubricating composition for low friction applications such as bearings

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monique R Jackson whose telephone number is 703-308-0428. The examiner can normally be reached on Mondays-Thursdays, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul J Thibodeau can be reached on 703-308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Monique R. Jackson
Patent Examiner
Technology Center 1700
June 26, 2003